

Running head: DEMAND FORECASTING

Describing Access and Forecasting Demand for Family Practice  
Services in the 121st General Hospital

Submitted in partial fulfillment of requirements for  
the Degree of Master in Health Care Administration

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### Abstract

Determining appropriate levels of staffing and appointment availability depends on the population served and their utilization. This project predicted the number of required providers based on the population at risk, its utilization patterns from Fiscal Years 2001 and 2002, and availability of Army Family Practice providers. The data included all visits from active duty to U.S. civilians, who are seen at the 121st General Hospital. Interestingly, active duty enrollees averaged three visits per year compared to the Department of the Army average of 7.2 in 2002. All utilization analysis was put into a model for predicting the level of capacity and services required, and for calculation of future provider requirements. The current model indicates 21,450 Family Practice visits per year and a shortfall of seven military providers or four civilian FTEs. Future increases in the population due to the Land Partnership Plan predict 33,833 visits and a shortfall of thirteen military or eight civilian FTEs.

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## Introduction

### Overview of the 121st General Hospital

The 121st General Hospital (GH) is an organization built on a Modified Table of Equipment (MTOE) and supplemented by an augmentation Table of Distribution and Allowances (TDA). It is part of the 18th Medical Command, which is a subordinate command under the Eighth United States Army (EUSA). The 121 mission is to integrate, organize, resource, train, command, control, and support assigned and attached medical units in order to provide a comprehensive system of Theater Health Support (THS) to the Eighth United States Army (EUSA) and all supported forces throughout the Korean Theater of Operations across the entire spectrum of plausible conflicts - from peacetime engagement through combat operations (18th MEDCOM, 2002). As the only Level III facility in South Korea, the 121st General Hospital (GH) also serves as the referral center for the entire population of eligible beneficiaries in South Korea, which includes active duty service members from all services, their family members, and all retired beneficiaries. It also serves a non-combatant population that is not usually cared for in the United States. This population includes U.S. civilians from the U.S. Embassy, Department of Defense (DoD) civilians, DoD Dependent Schools (DoDDS) teachers, and U.S. contractors.

The 121st General Hospital has 61 operational beds, with the capability of expanding to 476 beds for combat operations. The commander of the 121st is also dual-hatted as the commander of

the 18th MEDCOM. The commander of the 18th MEDCOM is responsible for meeting the total health needs of the command of the United States Forces Korea (USFK) using the available assets within the theater. As the Level III health care facility in the theater, the 121st GH currently has the capabilities in Table 1.

There are two major challenges for this organization. One of the largest challenges the hospital faces is to provide health care to all of these beneficiaries, while being manned under an MTOE instead of a TDA. The extended health care mission requires the hospital to function with an augmentation TDA to supplement the MTOE in order to be able to successfully complete the combat health mission.

The other large challenge in the provision of health care in South Korea is the geographical isolation and distribution of American forces across the Korean Peninsula. There are 11 Army health clinics at camps (not including 2nd Infantry Division battalion aid stations), which are located all over the country (see Appendix 1). The distances and traffic congestion create long ground evacuation times in South Korea. Forward Support Medevac Teams (FSMT) of two evacuation companies (Air Ambulance) are positioned with many of these clinics to mitigate the risk of lengthy evacuations for patients with the potential loss of life, limb, eyesight, or other medical emergencies. This is further coupled with a long flight time from South Korea to the nearest U. S. medical center - Tripler Army Medical Center (TAMC), Hawaii.

Table 1. 121st General Hospital Available Services

Primary Care	Specialty Care	Surgical Services	Ancillary Services	Behavioral Health and other services
Family Practice	Dermatology	General Surgery	Pharmacy	Psychiatry
Aviation Medicine	EFMP/EDIS	Oral-Maxillofacial Surgery	Pathology	Psychology
Immunizations	Neurology	Anesthesiology	Radiology	Social Work
Pediatrics	Psychiatry	Neurosurgery	Nutrition Care	Alcohol Treatment Center
	Obstetrics/Gynecology	Orthopedics		Chaplain Services
	Internal Medicine	Podiatry		Optometry
	Emergency Medicine	Otorhinolaryngology		Speech pathology
	Occupational Therapy	Ophthalmology		Audiology
	Physical Therapy			Preventive Medicine
	Physical medicine & Rehabilitation			

Note: Urologist is authorized but not filled. EFMP = Exceptional Family Member Program. Source: 18th MEDCOM, 2002.

These time-distance factors affect the provision of medical care in two significant ways. The first effect is in average lengths of stay (ALOS). The average length of stay is higher for 20-44 year olds in the 121st compared to the regional MTF in all inpatient categories, medicine, and surgery (TRICARE management activity (TMA), 2000). This is usually because the patients are either awaiting evacuation off the peninsula, or are kept until

their units coordinate for appropriate transportation back to their parent camps. On the other hand, the ALOS for 44-64 year olds is lower. This is most likely because there are fewer retirees here, and the acuity of the patients within these age groups usually requires care beyond the capability of the 121st General Hospital, so they are transferred out sooner (TMA, 2000).

The second impact of the time-distance factor is in access to medical care. The time required for travel decreases the available time for a patient to make an appointment. This factor is compounded when there are a limited number of appointments because of provider availability. The travel time for readiness requirements also decrease provider availability. For example, the M-16A2 range is not on Yongsan garrison and is a 45-minute one-way trip. Having only 15 firing lanes, which are used for zero and qualification, the range operation takes a full day to complete, thus removing the provider from the hospital for an entire day. This time-distance factor adds to both provider and patient unavailability when trying to maximize access.

Access to care in an American facility is very important to many U. S. beneficiaries in South Korea. TRICARE prime is only available to active duty and their family members. Military retirees and their family members are covered under TRICARE Standard, and they can enroll in TRICARE Plus if the MTF has excess capacity. DoD civilians, DoDDS teachers, U. S. Embassy workers, U. S. contractors and their dependents must pay for



their care at the MTF; however, the convenience and comfort of American care are major reasons for accessing primary care here at the 121st GH versus at a host nation facility. The leadership of the hospital is dedicated to meeting access standards mandated by TMA and meeting the current and future needs of the community. This project will attempt to explore the efficiency of the primary care delivery in this unique environment by assessing enrollment capacity and demand. The TRICARE access standards are listed in Table 2.

Table 2. TRICARE Access Standards.

TRICARE Access Standards			
Appointment Type	Access Standard	DoD Goals	
		June 1998	March 1999
PCM-Initial primary care	30 days		
SPEC-Initial specialty care	30 days		
ACUT-Acute	24 hours	98%	90%
ROUT-Routine Appointment	7 days	98%	90%
WELL-Wellness, health promotion	30 days		
PROC-Procedure with designated duration	Provider designated duration		
EST-established patient (established patient Follow-up)	Provider designated duration		
TCON-Telephone consult	Provider designated duration		
GRP-Group care	Provider designated duration		

Source: TRICARE Management Activity

These access standards will become increasingly harder to achieve as military commanders in South Korea push for more family members to accompany soldiers during their tours.

### Future of the beneficiary population

The Land Partnership Plan (LPP) Agreement is an agreement between the United States Forces Korea (USFK) and the Republic of Korea (ROK) to consolidate U.S. Forces and land assets in order to create 'more efficient and effective stationing of U.S. Forces' (Wilson, 2002). The effects of the LPP will reduce the total number of Army Camps from 41 to 23, while keeping the active duty personnel numbers constant. Along with the consolidation of camps, an increase in family members is also expected as General LaPorte, Commander of the USFK, continues the effort to make South Korea the assignment of choice.

In order to support the LPP and the increase in beneficiaries, the Army Health Facilities Planning Agency has also studied the population and possible population increase. The study calculated the total unique users of the 18th MEDCOM medical clinics throughout the country, and then projected the future active duty, active duty family member, and other populations based on the LPP and average military-family demographics.

### Conditions Which Prompted the Study

The leaders of the hospital are concerned that beneficiaries do not receive optimal access to care because of the inefficiencies of the primary care delivery system. This has the potential to become a much larger problem as the decisions of the Land Partnership Plan (LPP) are implemented. The leadership of the hospital would like to know what the appropriate model is

for sizing primary care clinics, and from that, what the appropriate resources are to meet the access demands of the changing beneficiary population.

#### Statement of the problem

The problem is two-fold. First, the 121st GH needs to assess capacity and analyze demand in order to make key strategic decisions for the changing population of beneficiaries in South Korea. Second, the hospital needs to develop a tool for forecasting demand for primary care services as the population changes. This is further defined as determining the population served in the 121st General Hospital, analyzing utilization rates, and determining future access demands on the health care system.

#### Literature Review

Access to health care is one of the three points of the triangle of competing demands for health care delivery. Cost and quality are the other two points and are in constant competition for the same resources of time and money (Barton, 1999). However, the first point into the health care system is the availability of services and the access to them.

Barton (1999) defines access by describing the dimensions of access. The dimensions of access are factors that affect the entry into the health care system. Barton (1999) defines these dimensions as geographic, physical, temporal, socio-cultural, and financial.

The dimension of access, which most affects military health

care beneficiaries, is the temporal dimension. This dimension is defined as the difficulty of accessing appointments because of patient work schedules and time constraints, or provider availability and wait times (Barton, 1999). This temporal dimension is the time-distance factor mentioned in the introduction of this paper. The other dimensions such as financing and physical access have less affect on access to care in the military. In the military health system, all eligible beneficiaries have health care as part of their benefits of employment. Most are young, healthy and do not have cultural barriers which prevent them from accessing care.

A more appropriate definition of access is the Institute of Medicine's (IOM) definition from the 1993 report on Access to Health Care in America. In attempting to define the appropriate level of access to health care, the 1993 IOM report decided that the dimensions of access should not affect the definition. The 1993 IOM report defines access as "the timely use of personal health services to achieve the best possible health outcomes," (Millman, 1993, p. 33). This definition infers that there is appropriateness to access. Too much access increases cost and the chances of nosocomial infections or iatrogenic illness. Too little access decreases overall health of a population and average life expectancy. This definition of access as timely care, producing good outcomes is what the Army and most health care organizations attempt to achieve. In order to deliver timely care, the organization must have enough providers and

support staff.

#### Provider availability

Access imperatives and improvement in the military are not new subjects. A 1979 United States General Accounting Office (USGAO) report studied the military health system and was so affected by the state of the health system, they titled the report, "Military Medicine is in trouble: Complete reassessment needed." The essence of the report identified the access problem as a lack of physicians in the military (USGAO, 1979). While the military has bridged many gaps identified in physician recruitment, incentives, and pay schedules, physician availability remains an issue.

Since physicians influence 75% of health care expenditures (Barton, 1999), there are many studies and initiatives to understand, control, monitor and affect physician productivity. One outcome of productivity monitoring in the military health system is optimization of physician services.

The Military Health System (MHS) optimization plan (TMA, 1999) has three underlying tenets:

- 1) Effective use of readiness-required personnel and equipment to support the peacetime health service delivery mission.
- 2) Equitable alignment of resources to provide as much health service delivery as possible in the most cost effective manner within the MTF.
- 3) Use of the best, evidence-based clinical practices and a

population health approach to ensure consistently superior quality of services.

The first point above is even more demanding in the 121st GH because it is an MTOE unit, operating with TDA-like responsibilities and beneficiaries. Available physician hours are likely to be less than other like-sized TDA facilities. The full time equivalent (FTE) availability is important in determining if the available FTEs match up with optimization goals. The MHS Optimization plan (TMA, 1999) estimates that each primary care physician should have 1300 to 1900 patients enrolled to each provider. A recent OTSG study indicates that 1178 is the standard mean for primary care enrollment per provider (OTSG, 2002). The study used data from the military health system data repository to calculate primary care enrollment based on population, utilization rates, available FTEs, office space, and other factors. The mean enrollment capacity is the mean of all providers levels and types, assuming a 9-hour workday with a full time provider having 7.5 clinical hours per day.

#### Previous enrollment capacity model studies

LaMar, Jacoby, Meyer, and Potter (1997) presented a provider workforce model in Military Medicine. This model was based on the enrolled population and HMO provider staffing levels, adjusted for the uniqueness of the military. Provider specialty mixes of 45 percent primary care and 55 percent specialty care were determined from surveys from one previous study (Weiner,

1994), and data from the Group Health Association of America (LaMar et al., 1997).

LaMar's model assumes that a military physician is nearly equivalent to an employed civilian physician and has 100 contacts per week for 47 workweeks (LaMar et al., 1997). On the other hand, the Health Affairs estimates that there are between 112 and 148 contacts per week for 46 workweeks for military physicians' clinical duties (Bailey, 2000). While LaMar's model accounts for resident physicians, it does not attempt to predict the additional providers required because of expansion of services or population demographics changes. LaMar et al. (1997) used their model to conclude that the initial estimation of 146.4 providers per 100,000 is roughly ten providers too few for a military setting. This suggestion means that for every 100,000 people there should be 156 providers, or roughly 639 people per one provider. The researchers also admit that their study was the starting point for future modeling projects.

In 2002, Johnson published a study that compared the primary care enrollment levels in the military to group model health maintenance organizations (HMO). The study's purpose was to use similar civilian organizations by which to benchmark the primary care enrollment numbers (Johnson, 2002). The author took the average enrollees per primary care manager (physicians, nurse practitioners, and physician assistants) of five civilian staff or group HMOs. Based on similarities between military health care and staff or group HMOs, Johnson recommended the military

health system use the average of the five HMOs as the benchmark for enrollment. This average was 1156 enrollees per PCM.

In the Bremerton model, Helmers (2001) used a much more in-depth analysis of provider time in order to come up with a provider enrollment capacity model. He accounted for all non-clinical activities and duties that take away time from providers. Based on the same equation used by MEDCOM to calculate enrollment capacity, Helmers (2001) determined that the average PCM should have 791 patients empanelled to him. In the example of a Family Practice teaching physician, the enrollment capacity is calculated at only 617 patients.

#### Appointment availability

The patient perspective of accessibility can be seen in the DoD survey of health beneficiaries annual survey. Analysis of the 1998 annual survey indicated that there was a significant opportunity to improve access to health care. This was reflected in the survey performance improvement plan for Seoul Army Community Hospital. 'Access to health care' was the only one of 11 access measurements that predicted satisfaction, and received a low score (Maxfield, 1999) (See Figure 1).

Although satisfaction with access was close to meeting the benchmark in 1999, the score for Seoul Army Community Hospital went down significantly in 2000. In 2000, survey respondents of the health care survey of DoD beneficiaries indicated that the Seoul Army Community Hospital (which included all Army health clinics in South Korea) was well below the benchmark in ease of



getting needed care and ease of getting care quickly. The composite score included all beneficiaries and is the lowest scores in the Asia region (See Table 3).

Table 3. 2000 Health Care Survey of DoD Beneficiaries.  
All Users , Asia

'2000 Composite Scores'												
	Total Score	Ease of Access		Communication and Customer Service				Ratings				Prevention
	Total	Getting Needed Care	Getting Care Quickly	Courteous and Helpful Office Staff	How Well Doctors Communicate	Customer Service	Claims Processing	Health Plan	Health Care	Primary Care Manager	Specialty Care	Preventive Care
Benchmark	NA	73	77	91	89	55	79	54	68	71	73	90
CONUS MHS	81	67	70	87	86	46	74	45	57	65	66	89
Asia	79	67	69	87	86	49	64	45	52	55	63	87
ACH Seoul	74	56	62	82	83	43	64	38	42	55	59	86
Kadena AFB	84	78	74	90	87	58	***	53	57	54	70	92
NH Guam/Andersen AFB	83	78	72	87	89	58	***	51	57	58	59	89
NH Okinawa	79	68	68	86	84	53	***	48	57	65	64	84
NH Yokosuka	80	68	74	89	87	48	***	45	54	44	56	88
Osan Air Base/Kunsan Air Base/Taegu Air Base	78	68	73	92	87	39	68	43	53	51	72	83
Yokota Air Base/Misawa/AHC Camp Zama	83	70	72	88	90	54	***	54	58	61	70	89
Source: 2000 Health Care Survey of DOD Beneficiaries												
Indicates score significantly exceeds benchmark												
Indicates score significantly falls short of benchmark												
NA Indicates benchmark not available												
*** Indicates significance not available												

Beginning in 2001, the survey was sent out quarterly, with results combined into an all Asia region, which includes Army, Air Force and Navy health facilities. These reports, stratified by beneficiary category, also indicate that access scores fall below targeted goals. However, it is difficult to tell how the 121st GH performs when these scores are consolidated. (See Table 4).

In an attempt to capture a better picture of demand of health services, a 1998 graduate study was conducted on the

Table 4. Ease of Access from 1999 to 2002.

	1999		2000		Jul 2000 to Jul 2001		Oct 2000 to Sep 2001		Jan 2001 to Jan 2002		Apr 2001 to Mar 2002	
	<b>Ease of Access</b>		<b>Ease of Access</b>		<b>Ease of Access</b>		<b>Ease of Access</b>		<b>Ease of Access</b>		<b>Ease of Access</b>	
	<a href="#">Getting Needed Care</a>	<a href="#">Getting Care Quickly</a>	<a href="#">Getting Needed Care</a>	<a href="#">Getting Care Quickly</a>	<a href="#">Getting Needed Care</a>	<a href="#">Getting Care Quickly</a>	<a href="#">Getting Needed Care</a>	<a href="#">Getting Care Quickly</a>	<a href="#">Getting Needed Care</a>	<a href="#">Getting Care Quickly</a>	<a href="#">Getting Needed Care</a>	<a href="#">Getting Care Quickly</a>
<b>Benchmark</b>	<b>77</b>	<b>NA</b>	<b>73</b>	<b>77</b>	<b>75</b>	<b>78</b>	<b>73</b>	<b>77</b>	<b>73</b>	<b>77</b>	<b>73</b>	<b>75</b>
<b>CONUS</b>												
<b>MHS</b>	75	78	67	70	No data	No data	No data	No data	No data	No data	No data	No data
Asia	75	76	67	69	73	72	63	69	76	64	54	72
ACH Seoul	72	76	56	62	No data	No data	No data	No data	No data	No data	No data	No data

Source: Consolidated data from annual health care survey of DoD beneficiaries.

measurement of access within the information system used by the Army, the Composite Health Care System (CHCS). In this study, the researcher attempted to define and capture denied entry into the appointment system, in order to better capture the demand and lack of access for primary care. The study showed that with contracted, centralized appointment clerks, greater than 5% of the patients who called could not get an appointment 17 of 19 days of the measured month (Strait, 1998).

While measuring complete demand for access and appointment availability, as attempted in Strait's project, is relevant and important, the DoD had larger issues. The DoD's only measurement of lack of appointment availability was the DoD survey of health beneficiaries. Based on customer satisfaction data from May to July 1998, the DoD reported, "less than 15 percent of the 115 MTFs included in its analysis were able to schedule acute appointments within the standard" (USGAO, 1999, p. 7).

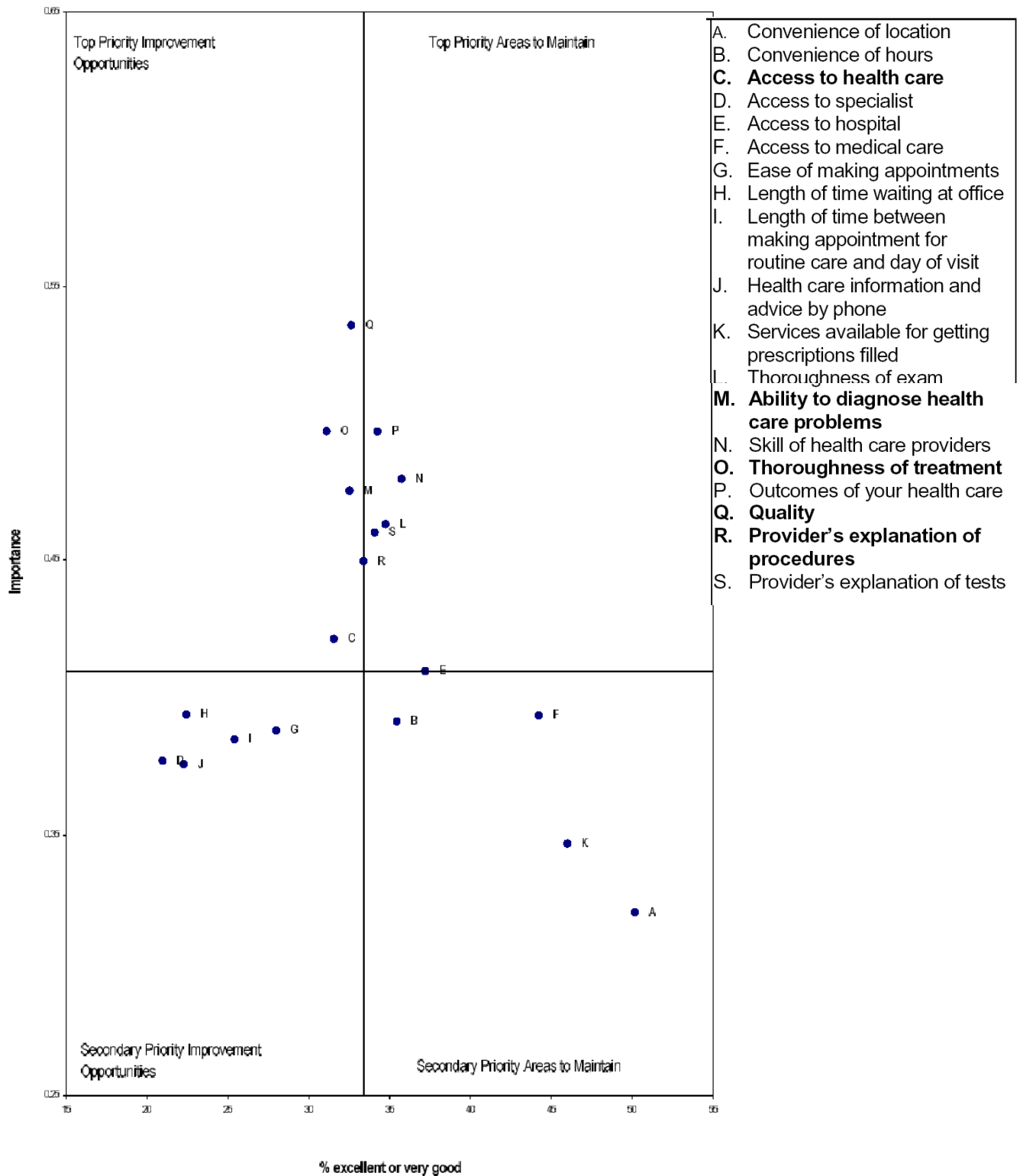
The DoD could not meet the access standards of 98 percent

of acute and routine primary care appointments scheduled in the timeframes listed in Table 2. Therefore in 1999, the DoD changed its access standards to require 90% of acute and routine primary care appointments scheduled within 24 hours and 7 days, respectively. The general standard was to look at the DoD customer satisfaction survey. This presented a validity problem, as satisfaction survey data were not consistent with CHCS data, relied on patient recall of over 45 days, and had small sample sizes for MTFs (USGAO, 1999).

Soon after the publishing of this report on appointment timeliness goals, the U. S. Army Medical Command (MEDCOM) issued a memorandum for all regional medical commands to measure wait time for appointments through CHCS. This memorandum requires all MTFs to send a monthly ad hoc report to the U. S. Army Patient Administration Systems and Biostatistics Activity (PASBA) that measures the time from date of appointment request and appointment kept (MEDCOM, 1999).

This memorandum is the policy enforcement for MTFs to report access standard measurements, and meets one of the requirements of the Government Performance and Results Act of 1993. The Government Performance and Results Act requires agencies to clearly define their mission, set goals, measure performance, and report on their accomplishments (USGAO, 1999). The memorandum was also the start of the Health Care Access Measurement (HCAM).

Figure 1. Performance Improvement Plan, ACH Seoul.



Source: 1998 annual health care survey of DoD beneficiaries.

The HCAM “determines the responsiveness of MTF patient care in terms of whether or not Primary Care Service appointments meet the Code of Federal Regulations Title 32, National Defense Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), access standards” (Roman, 2002, p. 1). The metric’s purpose is to measure compliance with TRICARE access standards by measuring the percent of appointments within the standard, divided by the total number of appointments requested. However, the data should not be used as the true indicator of meeting TRICARE access standards, as this measure only describes those who were able to make an appointment. Strait (1998) demonstrated that most of the time (17 of 19 days), greater than five percent of the population calling for appointments could not get an appointment.

#### Purpose

The purpose of this project is to create a provider model for predicting primary care capacity and future health care demand for use in strategic decision-making.

#### Methods and procedures

Population health planning has been the focus of the MHS for several years. Since publishing the MHS Optimization plan in 1999, the focus on population health improvement has gained momentum. There are seven key process elements within the MTF implementation guide of the population health improvement plan (DoD TMA, 2001) (See Figure 2). This project will address the first two; identify the population and forecast demand. The

methodology includes determining the eligible population from local databases, calculating the using population and utilization rates, describing visit data, and predicting future demand.

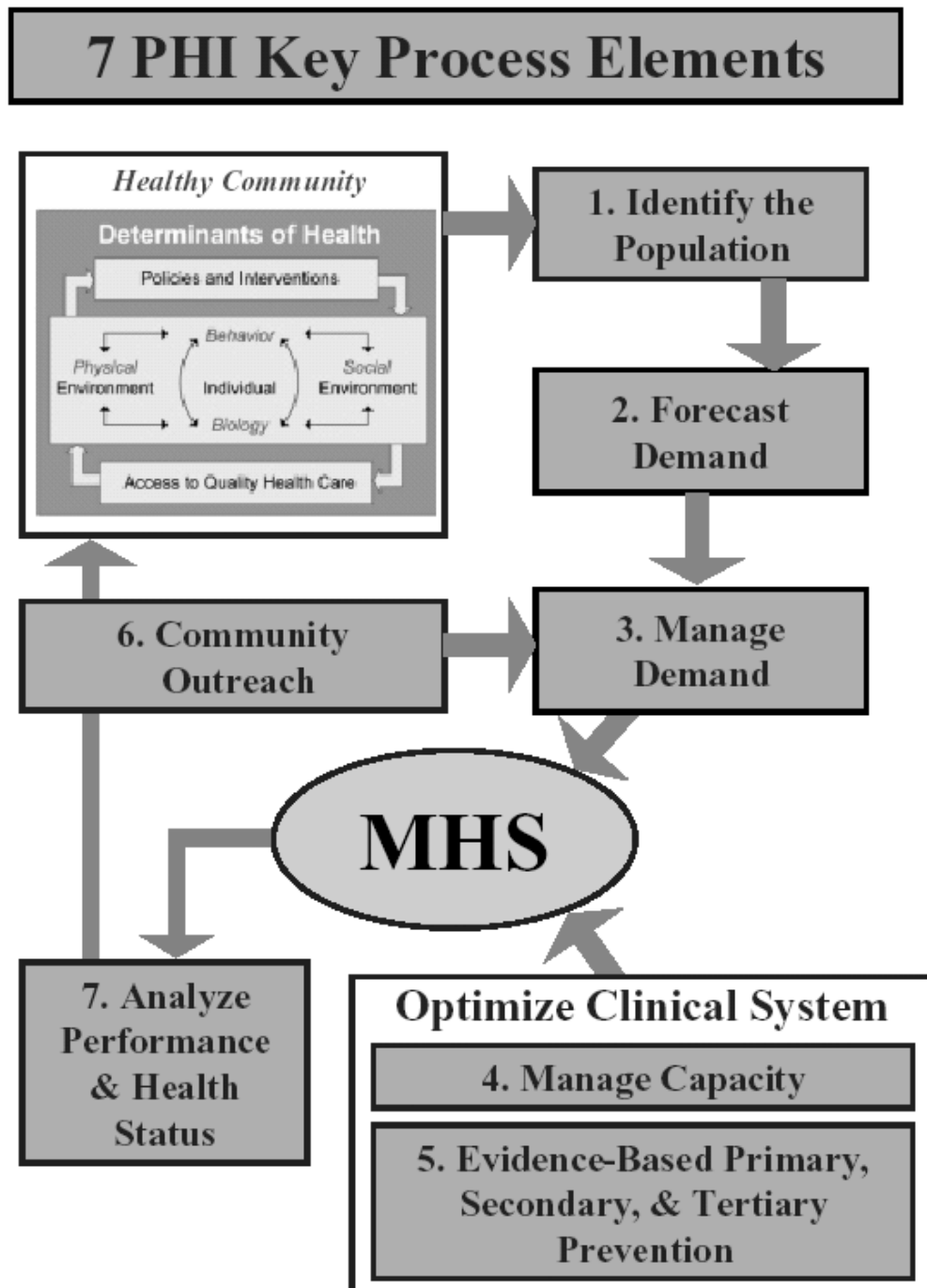
The next step is to compare the model to historical data and capacity (using a model similar to the Bremerton model) to determine the difference in demand and capacity. These assessments will enable the command to make decisions on appropriate staffing or services provided.

#### Operational definitions

Under the same guidance used by the Office of The Surgeon General (OTSG), primary care is defined by services given by providers in Family Practice, General Practice, Aviation Medicine, General Internal Medicine, and Pediatrics. For purposes of this study, only Family Practice providers (Physicians, Nurse Practitioners, and Physician Assistants) are considered as primary care providers. The pediatric clinic was not analyzed for this study. 121st GH considers internal medicine as specialty care, and has aviation medicine under a different unit.

The measured variables for visit data are: visit, age, beneficiary category, and ICD-9 category. Visits are the dependent variable and age, beneficiary category, and ICD-9 category are the independent variables. A visit is a face-to-face encounter between patient and physician. Age is simply the age of the patient at the time of the visit. Beneficiary

Figure 2. Process Elements of Population Health Improvement,  
TRICARE Management Activity



categories are active duty (all services), active duty family members, retirees, retiree family members, civilians, others, and Korean Augmentee to The United States Army (KATUSA). These categories are listed in detail in Appendix 1. A full time equivalent (FTE) is defined as the number hours of work per one provider. For this study, a full time (FT) physician would be able to see 22.5 patients per day in a 7.5-hour clinical workday. A civilian FTE would be at or very close to the full time provider. A military FTE would be less than a civilian FTE because of the readiness requirements placed on military providers.

#### Reliability and Validity

All data for use in reliable and valid studies should be complete, accurate, timely, and fit for its intended use. The data used to calculate historical workload and provider availability come from the local CHCS and MEPRS databases for the Fiscal Years (FY) of 2001 and 2002. The Department of Defense FY is from calendar month October to September. This data is our only source for historical data mining, and may not measure 'appropriate' use of health care. However, while all data cannot be perfect, the MEDCOM has processes in place for MTFs to improve data through the Data Quality Management Program. This has had a positive effect on the data quality of all military health system data. The methodology and process of projecting demand is taken from the U. S. Army MEDCOM MHS optimization and population health improvement plans, and have



been employed through many TRICARE lead agents.

All data collected for the analysis and model development come from CHCS, or the military health system's data repository. Only one outside source had to be used to identify the civilian population served here in Yongsan, South Korea.

No patient identifiable characteristics were required for this retrospective analysis, and therefore no ethical dilemmas were encountered during this study.

#### Expected findings and utility of results

The historical visit data may show that there is excess capacity for primary care and may highlight the inefficiencies of the primary care system so that the organization can increase access and access standards. The modeling process of measuring capacity and demand will ensure the command has a tool for use in making strategic decisions in a fluid political and changing health care environment.

### Results

#### Population

The eligible and enrolled population served was calculated from data collected from FY 2001 and 2002. The eligible population for the 121st includes all possible beneficiaries within a 20-mile radius. Therefore, the beneficiaries (mostly active duty and KATUSAs) enrolled at the Yongsan Health Clinic had to be subtracted from the total. The average enrolled numbers from FY 2001 and 2002 for the Yongsan Health Clinic were

subtracted from the total eligible numbers to arrive at the eligible numbers for the 121st GH. The total eligible population for the 121st GH during FY 2001 and 2002 is 11,746. This total includes all civilians who are eligible. The civilian total comes from the USFK J1, who tracks the number of civilians in the Yongsan area. The average enrolled population from the same time period for the 121st GH was used to calculate the 121st enrolled population. The civilian population was added into the enrolled population, like it was in the eligible population. The enrolled population total is 8,879. Table 5 shows the calculations for the total eligible and enrolled population for the 121st GH. The identified population is critical to the rest of the model development and to understand utilization of primary care services.

Table 5. Population Calculations for FY 2001 and 2002

Population calculations for 121st GH eligible and enrolled population											
		Yongsan Garrison eligibles			Average enrolled populations			121st GH eligible and enrolled populations			
		Eligible population <65	Eligible population ≥ 65	Total eligible	Enrolled population YongsanHC	Enrolled population 121st	Tot enrolled	Non-TRICARE using pop 121st	121 eligible population	121 enrolled population	121 using population (ave FY01,02)
	data source	M2 prism dm	M2 prism dmis		M2ChildDmisenroll						
AD	M2	7,708	1	7,709	6441	635	7,076		1,268	635	1,629
ADFM	M2	2,913	48	2,961	126	2444	2,570		2,835	2444	1,898
RET	M2	676	55	731		100	100		731	100	645
RETFM	M2	1,151	61	1,212			-		1,212		669
CIV	USFK J-1			5,251			-	5,251	5,251	5,251	1024
OTHER	M2	321	35	356			-		356	356	35
KATUSA	USFK J-1			93	1773		1,773	93	93	93	100
TOTALS		12,769	200	18,313		3,179	11,519	5,344	11,746	8,879	6,000

Utilization of services

Primary care service utilization was determined by gathering CHCS visit data of unique users for specified clinics. Weighted averages were taken for each beneficiary category within the Family Practice clinic. The averages for each beneficiary category were calculated by taking the sum of the products of visit rate and beneficiary visits, and divided by the total number of visits for the beneficiary category. This gives us the average according to the volume of visits, which is more accurate than the straight average. For instance, U.S. Army active duty visits account for 4,628 visits in FY 2001 and 4,451 visits in 2001. This volume from Army service members is greatly larger than the other active duty service members. If the volume of visits were not accounted for in the average, the true average would not be accurate or skewed toward the majority for which the visits are accounted.

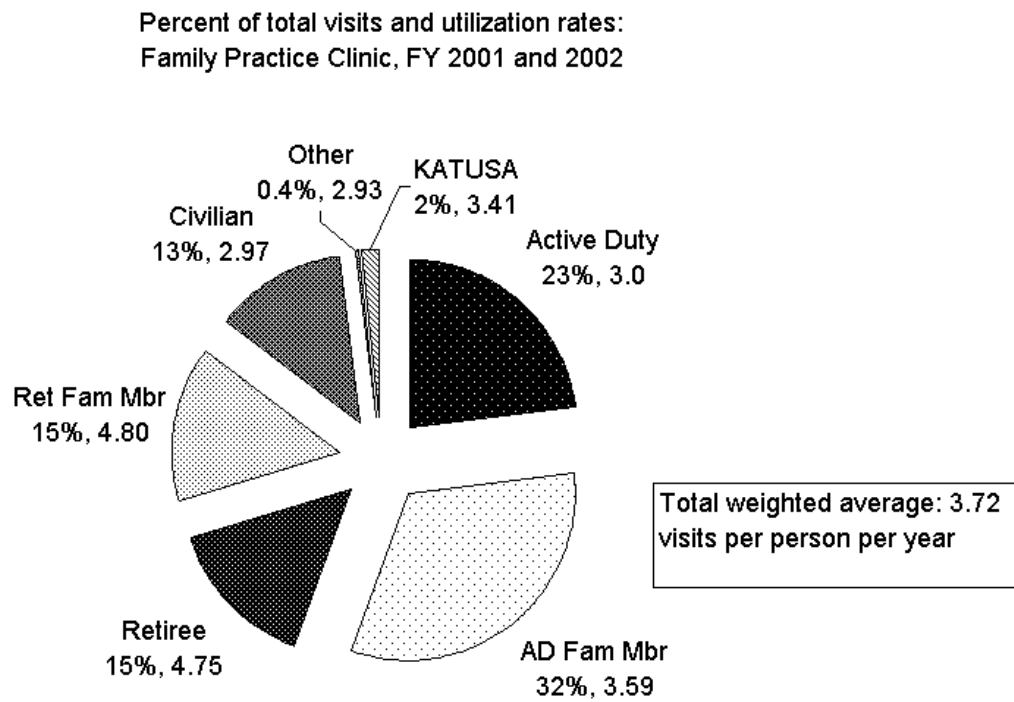
The results of the analysis of two years of data are listed in Table 6. These results show that the average visits per patient per year for the Family Practice is 3.72. The utilization rates for the Family Practice clinic were derived from the weighted averages of 41,752 visits of Family Practice providers (see Appendix 3). There were no other providers accounted for in the FTE analysis in FY 2001 and 2002.

Table 6. Utilization rates, Family Practice Clinic FY 2001 and FY 2002

Utilization rates by beneficiary category: Family Practice Clinic FY 2001 and 2002								
	Active Duty	AD Fam Mbr	Retiree	Ret Fam Mbr	Civilian	Other	KATUSA	Totals
Visits per patient per year	3.00	3.59	4.75	4.80	2.97	2.93	3.41	3.72
Percent of total	23.14%	32.44%	14.62%	15.00%	12.79%	0.37%	1.63%	100.00%

Source: CHCS Ad Hoc query, 2003.

Figure 3. Utilization rates, Family Practice Clinic FY 2001 & 2002



Patient codes from CHCS were categorized into their larger beneficiary category. Active duty Army, Navy, Air Force, Marines, Coast Guard and any other service member on active duty were put into the Active Duty beneficiary category for utilization data. Civilians include all DoD, Embassy, NATO, and other patients who sought care at the 121st GH. The other category includes emergency care, MASCAL, and other beneficiaries who did not fit into any of the previous groups. KATUSAs were separated because they are a special population that should be distinguished from U.S. service men and women. Once these utilization rates were calculated, the next step was to describe the visit data from the same two years.

#### CHCS Visit data

The data from the Family Practice clinic from FY 2001 and 2002 were analyzed using the Statistical Package for Social Sciences (SPSS) version 11.5. The purpose of this analysis was to describe the type of work completed at the 121st GH in visit variables. Over the two years 41,752 Family Practice visits were included. Deleted visits were those that were not reliably categorized. For example, contract employees with ages between 4-17 were not included in the Family Practice data set. The number of visits not used in the Family Practice data set is 23.

In order to better describe the data, certain variables were grouped. Age, ICD-9 category, and time of visit were grouped. These groupings and visit data are listed in Tables 7, 8, and 9. Other descriptive data charts are in Appendix 4.

Table 7. Visit data by age groups.

**Age group**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 - 17 years	820	2.0	2.0	2.0
	18 - 44 years	19491	46.7	46.7	48.6
	45 - 64 years	18246	43.7	43.7	92.3
	65+ years	3195	7.7	7.7	100.0
	Total	41752	100.0	100.0	

Table 8. Visit data by ICD-9 group.

**ICD-9 group**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Infectious disease	583	1.4	1.6	1.6
	Neoplasms	65	.2	.2	1.8
	Endocrine, immune disorder	2307	5.5	6.5	8.3
	Mental disorders	242	.6	.7	9.0
	Nervous sys	698	1.7	2.0	10.9
	Circulatory sys	1701	4.1	4.8	15.7
	Respiratory sys	2414	5.8	6.8	22.5
	Digestive sys	775	1.9	2.2	24.7
	Genitourinary sys	1182	2.8	3.3	28.0
	Skin & Subcutaneous tissue	509	1.2	1.4	29.4
	Musculoskeletal sys	2764	6.6	7.8	37.2
	Symptom ill-defined conditions	3636	8.7	10.2	47.4
	Injury & poisoning	424	1.0	1.2	48.6
	Supplementary classification	18281	43.8	51.4	100.0
	Total	35581	85.2	100.0	
Missing	System	6171	14.8		
Total		41752	100.0		

Table 9. Visit data by time group.

**Time group**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0600 - 0859	7101	17.0	17.0	17.0
	0900 - 1159	16519	39.6	39.6	56.7
	1200 - 1359	7117	17.0	17.1	73.7
	1400 - 1629	10689	25.6	25.6	99.4
	1630 - 1900	262	.6	.6	100.0
	Total	41688	99.8	100.0	
Missing	System	64	.2		
Total		41752	100.0		

The results of the descriptive analysis of the Family Practice clinic show that of the patients seen, the average age of the patients was 44.27 years with a standard deviation of 14.3 years (see Appendix 4). 41.5 percent were visits by men, and 58.5 percent by women. Stratified by age group, 46.7 percent of the patients seen were in the 18-44 year old age group, and 43.7 percent were in the 45-64 year old group. Male average age was 45.33 years, and female average age was 43.52 years.

When stratified by beneficiary category, active duty family members and active duty service members together accounted for 53.9 percent of all the visits. 31.2 percent were active duty family members, and 22.7 percent were active duty service members. Retirees and their family members accounted for 29.9 percent of total visits (n=41,752). Civilians only accounted for 12.6 percent of all visits between FY 2001 and 2002.

In Table 8, ICD-9 group data showed that 51.4 percent of coded visits (n=35,581) were categorized in category 14,

supplementary classification (V codes). The next most common categorized visit was category 12, symptoms of ill-defined conditions, at 10.2 percent of all visits. Together, these vague categories accounted for 61.6 percent of all visits during FY 2001 and 2002 (see Table 8).

The majority (39.6 percent) of visits occurred at times 0900 to 1159 and at times 1400 to 1629 (25.6 percent). A further analysis of appointment time data highlights the most commonly used appointment times. Most commonly used times was defined as those times with .7 percent of total visits or higher. These times are listed in Table 10 and are indicative of Family Practice clinic hours. The common appointment times listed account for 57.8 percent of all appointment times. Appointments started at 0830 and ended at 1530, indicating a clinic day of 0800 to 1600 with a lunch break between 1140 and 1300. This might also be used for approximating provider hours of 8 hours per day, with about half an hour for lunch. By this assessment of clinic hours, it appears that a full clinic day is approximately 7.5 hours per day. This becomes important in calculating available hours for a Family Practice provider.

One of the useful comparisons was in the utilization rates. The weighted average of active duty utilization rates was 3 visits per enrollee per year. The Department of the Army average for active duty, ambulatory care visits is 7.2 per enrollee per year (Nagaraji, 2003).



Table 10. Common appointment times.

Common Appointment Times					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	830	732	1.8	1.8	1.8
	840	729	1.7	1.7	3.5
	900	1691	4.1	4.1	7.6
	915	377	.9	.9	8.5
	920	807	1.9	1.9	10.4
	930	898	2.2	2.2	12.6
	940	822	2.0	2.0	14.6
	945	370	.9	.9	15.5
	1000	1614	3.9	3.9	19.4
	1020	793	1.9	1.9	21.3
	1030	810	1.9	1.9	23.2
	1040	764	1.8	1.8	25.0
	1045	324	.8	.8	25.8
	1100	1277	3.1	3.1	28.9
	1120	737	1.8	1.8	30.7
	1300	1603	3.8	3.8	34.5
	1320	847	2.0	2.0	36.5
	1330	779	1.9	1.9	38.4
	1340	873	2.1	2.1	40.5
	1345	384	.9	.9	41.4
	1400	1786	4.3	4.3	45.7
	1420	839	2.0	2.0	47.7
	1430	877	2.1	2.1	49.8
	1440	835	2.0	2.0	51.8
	1500	1671	4.0	4.0	55.8
	1520	308	.7	.7	56.5
	1530	526	1.3	1.3	57.8
Missing	System	6	.0		
Total		24067			

This lower rate amongst active duty enrollees could be due to many factors. One factor is that most of the active duty enrollees here belong to the 18th MEDCOM or are high-ranking

officers and noncommissioned officers who may not access the Family Practice clinic in traditional manners. This also could be just a lack of demand or access into the appointment system.

## Discussion

### Capacity

Calculating capacity for the 121st GH was modeled after the Bremerton model. Many categories on non-available time were tailored to fit the 121st GH. However, the numbers used for dictation, coding, CHCS, and patient preparation were the same. This data was calculated using a time in motion software package that this researcher did not have.

The capacity model's intent is to account for provider time and to calculate true available clinical time for the provider. The estimated available clinic time for a Family Practice provider is 64.78 hours per month, assuming a 7.5-hour clinical workday. When calculated with a three patient per hour rate of visit, this equates to 9.72 patients per day.

The top of the model is the input for the amount of clinical time available for one full time clinician. This does not account for one hour of lunch and two fifteen-minute breaks. Once available clinic time is entered, the model calculates the total available clinic time per month, and the possible number of visits per day per provider.

In step one the model calculates the total number of available clinical hours per year and per month based on a 52-week year and five day workweek.

Step two subtracts the amount of leave, federal holidays and continuing medical education (CME) time from the hours calculated in step one. Step two assumes a 30 days of leave per year, 11 federal holidays, and 3.3 hours of CME per month. The 3.3 CME hours per month is a number used by the OTSG.

Step three includes all other training and administrative time that cannot be used for clinical time. The worksheet includes three major categories to account for time. The first is patient support duties. These duties are mandatory training requirements for patient care or administrative uses. Training for coding, the Joint Commission for Accreditation of Health care Organizations survey, department meetings, and customer service are examples of this training. Telephone consults, reviewing results, dictation, coding, patient preparation and CHCS all come from the time in motion study done in the Bremerton model (Helmerts, 2001). All of these items, except dictation were included in the accounting of non-clinical time. Dictation was not included, because the Family Practice clinic providers do not perform this task.

Step four is the difference of available time calculated in step two and the training and administrative time calculated in step 3. This is the total calculated available time for clinical work for the provider.

In the final part of the model, step 5, the available clinical time in (hours per month) is divided by the four weeks in a month. This number is multiplied by the throughput capacity

of the clinic. For the Family Practice clinic, the assumption is that the clinic can reasonably work through three patients per hour. This rate is reasonably determined by common appointment times and by provider feedback. The number determined by multiplying the throughput rate by the weekly clinical hours available, determines the number of patients one provider can see per week. The weekly capacity is then divided by 5 days per week to determine the number of patients per day. This model predicts 11.1 patients per day for a military provider. This number must then be used to calculate the time per patient for work on coding, patient preparation, and CHCS. This number is added to the training and administrative time. The model is recalculated to determine the adjusted patients per day capacity of 9.39 patients per day.

The average actual hours per FTE per month for Fiscal Years 2001 and 2002 is 134.19 hours. This was calculated by first subtracting the non-available hours from the available hours, then dividing this number by the number of FTEs for that month. This number, the available hours per FTE, was calculated for 24 months of Fiscal Years 2001 and 2002 to come up with the 134.19 available hours per FTE per month. Based on three patient per hour throughput, and twenty workdays per month, this equates to an average of 20.13 patients per day, twice as many as the model predicted. This means that the military provider spent twice as much time seeing patients than predicted to see, when accounting for readiness duties.

Step 6 compares the model to the full time provider capacity of 22.5 patients per day. If the full time provider sees 22.5 patients per day, the calculated military FTE is .42. The historical FTE is .89. Again, this shows that the historical workload of providers was twice the amount that should be if accounting for readiness time. The capacity model used is in Appendix 5. The same model was used to estimate civilian provider capacity. The civilian capacity model does not account for any military readiness requirements, and calculates a capacity of 13.37 patients per day and .59 FTEs.

The next step was the development of a requirements model using the data collected from FY 2001 and 2002 for an estimate for future visits. This included listing the distribution of the population in Yongsan among the beneficiary categories. The using rate was calculated by dividing the number of visits by the unique users from the same CHCS data used to calculate utilization rates by beneficiary category. By entering the total number of the eligible population, the model calculates the number of expected visits per beneficiary category (see Appendix 6). Using this model, the 121st GH should expect 21,450 Family Practice visits per year. This is not far from the actual annual visit data of 20,984 and 20,768 visits for Fiscal Years 2001 and 2002. Based on the utilization rates of each beneficiary category, the user enters the total population, and the model distributes the visits amongst beneficiary category and calculates total Family Practice visits required.

A model for the Land Partnership Plan was also created which increases the active duty family member population 2.8 times the current levels. This rate was taken from the Health Facilities Planning Agency study (2002), which assumed 57 percent of active duty service members would be married, and 50 percent will be accompanied tours in South Korea. Assuming the increase in active duty family members while all other populations and utilization rates remain the same, 33,833 visits per year can be expected if the LPP goes into full effect. These numbers are probably underestimated by at least five percent, given the previous study by Strait (1998). Whatever the approximation, the 2.8-times increase in family members will increase the number of Family Practice visits. This will put a strain on the clinic, which, by this study, is already working over its capacity.

#### Capacity versus requirements

Current capacity assessment shows that each military FTE according to the Bremerton model can see 9.4 patients per day. This capacity model shows a military FTE is .42. A civilian FTE can see 13.4 patients a day and is equal to .59 FTE.

According to the actual available FTE data collected from two years, one FTE saw about 20 patients per day (shown in Appendix 5). Multiplied by the average number of FTEs during the time period (3.05), the total patient capacity per day was 63 for the two measured years. Actual collected visit data shows that providers averaged 94 visits per day (see Table 11). Therefore the providers either worked longer clinic hours (not

evident in common appointment times) or they did not complete the required readiness tasks for this command. Table 11 shows capacity and requirement differences, and highlights the fact that during this time period, the providers worked longer and saw more patients to make up for the lack in available FTEs to meet the required demand.

More likely than not, most providers have sacrificed readiness training and time to cover the clinical requirement. As a deployed MTOE hospital, this command and its soldiers must maintain readiness for the transition to war mission. It is clear to this researcher that the data shows room for improvement in the number of military or civilian clinicians to handle the primary care demand. This demand will only increase, as the U.S. Forces increase the number of dependents on the peninsula. At current rates, the 121st GH would need seven more military providers or four more civilian providers just to cover the requirement under the available modeled capacity. Even under the historical workload, the providers still worked 1.5 FTEs more than what was reported as available. Additionally, under the proposed changes of the LPP, given historical workload, 121st GH would need at least eight more civilian providers. This must be accompanied by an increase in readiness training in lieu of military clinical time for future stability of the Korean peninsula.

Table 11. Capacity versus requirement

Capacity		Military model	Civilian model	FTE actual
	pts per day	9.39	13.37	20.13
	ave # clin FTE	3.05	3.05	3.05
Total patients per day	Total pts/day	28.64	40.78	61.40
<b>FY 01 &amp; 02 average</b>				
	pts per year	20,876		
44.45 weeks/military provider year	pts per week	469.65		
5 days/week	pts per day	93.93		
<b>Difference</b>				
	Excess capacity (lack)	(65.29)	(53.15)	(32.53)
	Additional Required FTE	6.85	3.88	1.52

Table 12. Capacity versus LPP requirement

Capacity		Military model	Civilian model	FTE actual
	pts per day	9.39	13.37	20.13
	ave # clin FTE	3.05	3.05	3.05
Total patients per day	Total pts/day	28.64	40.78	61.40
<b>Land Partnership Plan</b>				
	pts per year	33,833		
44.45 weeks/military provider year	pts per week	761.15		
5 days/week	pts per day	152.23		
<b>Difference</b>				
	Excess capacity (lack)	(123.59)	(111.45)	(90.83)
	Additional Required FTE	13.06	8.24	4.41

As with many studies, there is room for future investigation. Future studies could focus on calculating a multiple linear regression equation that predicts utilization of family practice services based on variables of age, beneficiary category and gender. This study can also be used as a start to conduct an expense and workload analysis and develop support



staff ratios. Other future projects could also compare emergency room visits or visits referred outside the facility, over the same time period to compare workload and diagnosis codes.

### Conclusions

This study had two main objectives. The first one was to describe the current visit data and calculate the capacity. The second objective was to create a model for predicting the required number of providers for future primary care demand.

Of the 41,752 visits in FYs 2001 and 2002, active duty family members and active duty service members accounted for 53.9 percent of all the visits. Retirees and their family members accounted for 29.9 percent of total visits, and civilians only accounted for 12.6 percent of all visits between FY 2001 and 2002. Based on 45 workweeks per year, the military Family Practice providers saw 94 patients per day although their measured capacity was only 61 patients per day.

This study's prediction model predicted 21,450 visits, very close to the measured visit rate of 20,876 visits per year. Coupled with a realistic accounting of available FTEs, the visit capacity versus requirements show a deficit of seven military providers or four civilian providers. The changes in the Land Partnership Plan show a possible future deficit of 13 military or eight civilian providers.

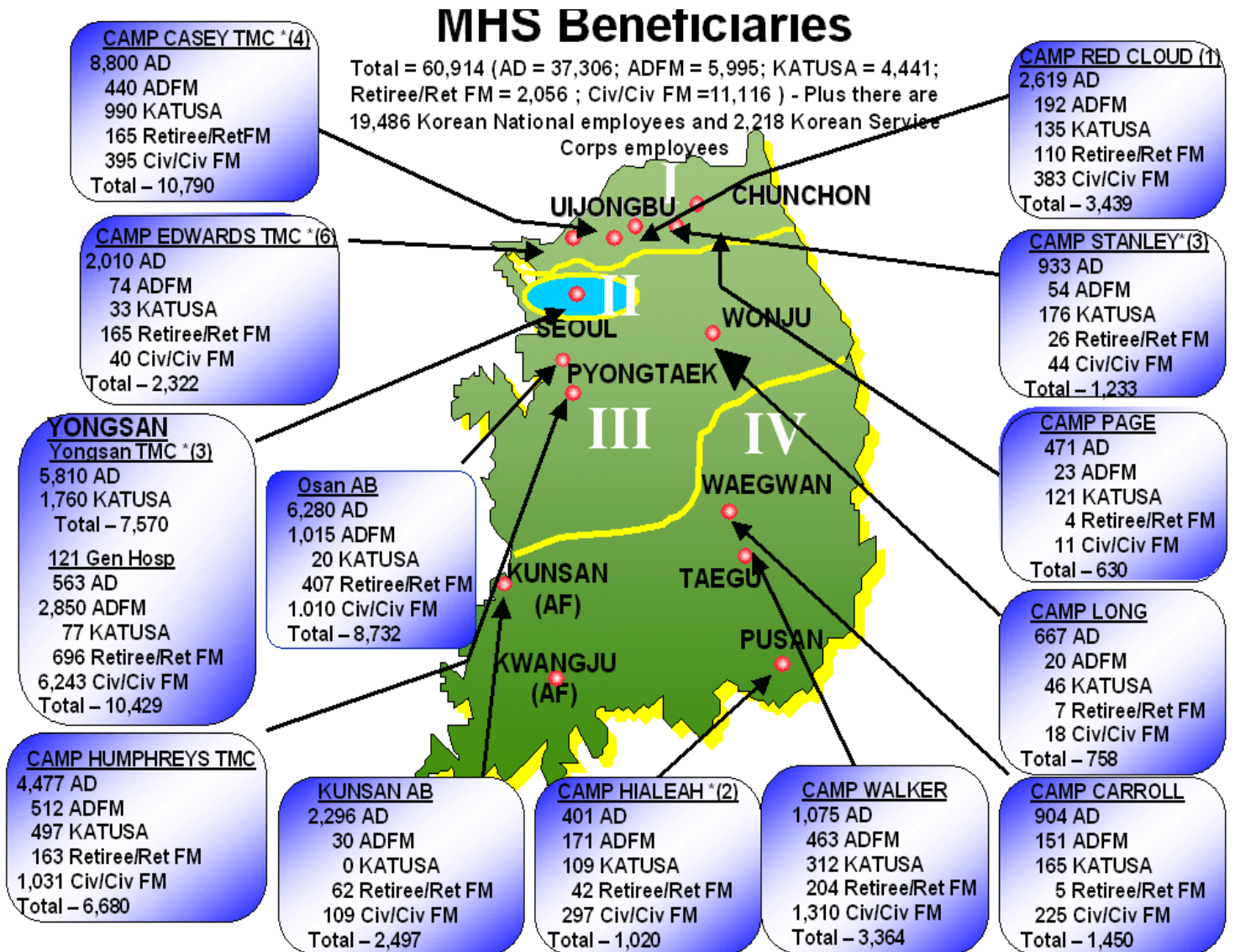
The value of this study is in the analysis of the data and use in the models created for the command. The model for capacity creates a tool for the commander to predict the number

of visits provided per day per provider as multiple time-consuming variables change. The analysis of the capacity versus workload is important for the potential of future hires to support the health care mission while the military provider is performing readiness duties.

#### Recommendations

Hospitals may want to use a similar method employed in this study to assess capacity versus administrative and readiness requirements. This assessment, coupled with historical utilization data can be a starting point for identifying resource requirements, or opportunities for improving time management. Many facilities should take this realistic look at the capacity and workload to manage their care processes, measure them, and set objectives and goals for the future.

## Appendix 1. South Korea Beneficiary Population by Location



\*( ) - indicates the number of other smaller camps serviced by that TMC (for example CP Edwards has 6 other camps that it services). These camps can be from 5-45 minutes depending on location and traffic at certain times of day.

Source: Clinical Operations Division, 18th MEDCOM as of October

2002

## Appendix 2. Beneficiary Category Groups

<b>AD</b>	<b>ADFM</b>	<b>Civilian</b>
USA ACTIVE DUTY	USA FAM MBR FAD	AGRICULTURAL DE
USA AD RECRUIT	USA FAM MBR AD	CIV EMPL/OTH FE
USA AD RES ENL	USAF FAM MBR AD	CIV EMPLOYEE AR
USA AD RES OFFI	USCG FAM MBR AD	CIV FACULTY U O
USA AD RES-30D	USMC FAM MBR AD	CONTRACT EMPLOY
USAF ACTIVE DUT	USN FAM MBR AD	DOD EMPL OCCUPA
USAF AD RES	USAF FAM MBR FA	DOD EMPLOYEE RE
USCG AUXILIARY		DOD FAM MBR REM
USMC ACTIVE DUTY		DOD SCHOOL TEAC
USN ADTIVE DUTY		FAM MBR AG DEPT
USN AD RES		FAM MBR COMM DE
		FAM MBR DOD SCH
<b>RET</b>	<b>RETFM</b>	FAM MBR NON-DOD
USA RET LOS ENL	USA FAM MBR RET	FAM MBR OTHER D
USA RET LOS OFF	USAF FAM MBR RE	FAM MBR RED CROSS
USA RET PDRL EN	USCG FAM MBR RE	FAM MBR USIA EM
USARET TDRL EN	USMC FAM MBR RE	GSA EMPLOYEE
USAF RET LOS EN	USN FAM MBR RET	OTHER DOD EMPLO
USAF RET LOS OF		RED CROSS EMPLO
USMC RET LOS EN		STATE DEPT EMPL
USMC RET LOS OF		STATE DEPT FAM
USN RET LOS ENL		US CIV EMPL AUT
USN RET LOS OFF		US CIV EMPL OF
USN RET PDRL EN		WC-DOD BENE DF
		WC-NON DOD BENE
<b>Other</b>	<b>Katusa</b>	DOMESTIC EMPLOY
USA APPLICANT/R	KATUSA	FMS NON-NATO MI
USA RE INACT D		FOREIGN CIVILIA
VETERANS ADMIN		NATO FAM MBR IM
EMERGENCY CARE		NATO FAM MBR OT
GUANTANAMO BAY		NATO MILITARY
GRD		NATO RECIP AGRE
GRD FM		NON-NATO FAM MB
USA FAM MBR DEC		OTHER NON-NATO
USAF FAM MBR DE		PATIENT NON ELS
USN FAM MBR DEC		
USMC FAM MBR DE		

Appendix 3. Utilization rate worksheet, Family Practice, FY 2001 and 2002.

FPC		08 Apr 2003@0946				
	PATIENTS	SUBCOUNT	TOT APPTS	Percent of TOTAL visits	Utilization rate (visits/year)	Weighted average
<b>AD</b>						
A11	USA AD	1516	4628	11.08%	3.05	
A12	USA AD RES	13	44	0.11%	3.38	
F11	USAF AD	102	222	0.53%	2.18	
F12	USAF AD RES	1	1	0.00%	1.00	
M11	USMC AD	16	32	0.08%	2.00	
N11	USN AD	22	45	0.11%	2.05	
N12	USN AD RES	1	1	0.00%	1.00	
fy02						
A11	USA AD	1464	4451	10.65%	3.04	
A12	USA AD RES	9	28	0.07%	3.11	
A13	USA AD RECRUIT	3	5	0.01%	1.67	
A15	USA NG <30 DAYS	1	1	0.00%	1.00	
F11	USAF AD	75	147	0.35%	1.96	
M11	USMC AD	13	33	0.08%	2.54	
N11	USN AD	21	32	0.08%	1.52	
N12	USN AD RES	1	1	0.00%	1.00	
		3258	9671	23.14%	2.97	2.995
<b>ADFM</b>						
A25	USA FAM MBR FAD-TAA	3	7	0.02%	2.33	
A41	USA FAM MBR AD	1602	5584	13.36%	3.49	
A45	USA FAM MBR DEC AD	19	116	0.28%	6.11	
C41	USCG FAM MBR AD	1	3	0.01%	3.00	
F41	USAF FAM MBR AD	168	584	1.40%	3.48	
F45	USAF FAM MBR DEC AD	2	9	0.02%	4.50	
M41	USMC FAM MBR AD	31	89	0.21%	2.87	
N41	USN FAM MBR AD	79	301	0.72%	3.81	
N45	USN FAM MBR DEC AD	1	1	0.00%	1.00	
fy02						
A25	USA FAM MBR FAD-TAA	3	5	0.01%	1.67	
A41	USA FAM MBR AD	1589	5759	13.78%	3.62	
A45	USA FAM MBR DEC AD	21	81	0.19%	3.86	
C41	USCG FAM MBR AD	1	2	0.00%	2.00	
F25	USAF FAM MBR FAD-TAA	1	1	0.00%	1.00	
F41	USAF FAM MBR AD	157	537	1.29%	3.42	
F45	USAF FAM MBR DEC AD	3	18	0.04%	6.00	
K79	USAF FAM MBR FAD-TAA	2	3	0.01%	1.50	
M41	USMC FAM MBR AD	34	143	0.34%	4.21	
N41	USN FAM MBR AD	78	308	0.74%	3.95	
N45	USN FAM MBR DEC AD	1	4	0.01%	4.00	
		3796	13555	32.44%	3.57	3.589

## Appendix 3. (con't).

FPC		08 Apr 2003@0946				
	PATIENTS	SUBCOUNT	TOT APPTS	Percent of TOTAL visits	Utilization rate (visits/year)	Weighted average
	<b>RET</b>					
A31	USA RET LOS	496	2396	5.73%	4.83	
F31	USAF RET LOS	115	533	1.28%	4.63	
M31	USMC RET LOS	12	55	0.13%	4.58	
N31	USN RET LOS	26	100	0.24%	3.85	
N32	USN RET PDRL	1	4	0.01%	4.00	
	fy02					
A31	USA RET LOS	490	2259	5.41%	4.61	
F31	USAF RET LOS	112	554	1.33%	4.95	
M31	USMC RET LOS	10	54	0.13%	5.40	
N31	USN RET LOS	28	156	0.37%	5.57	
		1290	6111	14.62%	4.74	4.75
	<b>RET FAM MBR</b>					
A43	USA FAM MBR RET	511	2479	5.93%	4.85	
A47	USA FAM MBR DEC RET	29	188	0.45%	6.48	
C43	USCG FAM MBR RET	1	1	0.00%	1.00	
F43	USAF FAM MBR RET	94	386	0.92%	4.11	
F47	USAF FAM MBR DEC RET	4	43	0.10%	10.75	
M43	USMC FAM MBR RET	6	20	0.05%	3.33	
M47	USMC FAM MBR DEC RET	1	1	0.00%	1.00	
N43	USN FAM MBR RET	22	59	0.14%	2.68	
	fy02					
A32	USA PDRL (ENL)	3	13	0.03%	4.33	
A33	USA TDRL	1	3	0.01%	3.00	
A43	USA FAM MBR RET	531	2410	5.77%	4.54	
A47	USA FAM MBR DEC RET	26	188	0.45%	7.23	
C43	USCG FAM MBR RET	1	4	0.01%	4.00	
F43	USAF FAM MBR RET	80	327	0.78%	4.09	
F47	USAF FAM MBR DEC RET	6	49	0.12%	8.17	
M43	USMC FAM MBR RET	5	21	0.05%	4.20	
N43	USN FAM MBR RET	16	77	0.18%	4.81	
		1337	6269	15.00%	4.69	4.80

## Appendix 3. (con't).

FPC		08 Apr 2003@0946				
	PATIENTS	SUBCOUNT	TOT APPTS	Percent of TOTAL visits	Utilization rate (visits/year)	Weighted average
<b>CIVILIAN</b>						
K51	STATE DEPT OCONUS	5	10	0.02%	2.00	
K52	STATE DEPT FAM MBR	7	11	0.03%	1.57	
K53	DOD TEACHER OCONUS	405	1275	3.05%	3.15	
K54	FAM MBR DOD TEACHER	252	645	1.54%	2.56	
K55	DOD EMPL REMOTE US	20	46	0.11%	2.30	
K56	DOD FAM MBR REMOTE US	17	29	0.07%	1.71	
K57	DOD EMPL OCC HEALTH	31	34	0.08%	1.10	
K59	FED EMPL REMOTE	6	7	0.02%	1.17	
K62	WC-NON DOD BENE, NDF	10	10	0.02%	1.00	
K65	CONTRACT EMPL/FAM MBR	101	356	0.85%	3.52	
K69	RED CROSS EMPL OCONUS	8	79	0.19%	9.88	
K71	FMS NATO CIV IND	1	3	0.01%	3.00	
K72	NATO MILITARY	14	37	0.09%	2.64	
K73	NATO FAM MBR IMET/FMS	9	42	0.10%	4.67	
K75	NON-NATO FAM MBR IMET	2	8	0.02%	4.00	
K76	FOREIGN CIVILIAN	37	37	0.09%	1.00	
fy02						
K51	STATE DEPT OCONUS	2	4	0.01%	2.00	
K52	STATE DEPT FAM MBR	1	1	0.00%	1.00	
K53	DOD TEACHER OCONUS	386	1250	2.99%	3.24	
K54	FAM MBR DOD TEACHER	219	668	1.60%	3.05	
K55	DOD EMPL REMOTE US	4	4	0.01%	1.00	
K56	DOD FAM MBR REMOTE US	6	8	0.02%	1.33	
K57	DOD EMPL OCC HEALTH	194	218	0.52%	1.12	
K59	FED EMPL REMOTE	1	1	0.00%	1.00	
K62	WC-NON DOD BENE, NDF	9	12	0.03%	1.33	
K65	CONTRACT EMPL/FAM MBR	135	303	0.73%	2.24	
K69	RED CROSS EMPL OCONUS	11	30	0.07%	2.73	
K71	FMS NATO CIV IND	1	1	0.00%	1.00	
K72	NATO MILITARY	10	26	0.06%	2.60	
K73	NATO FAM MBR IMET/FMS	14	53	0.13%	3.79	
K75	NON-NATO FAM MBR IMET	3	7	0.02%	2.33	
K76	FOREIGN CIVILIAN	127	131	0.31%	1.03	
		2048	5346	12.79%	2.61	2.969

## Appendix 3. (con't).

FPC		08 Apr 2003@0946				
	PATIENTS	SUBCOUNT	TOT APPTS	Percent of TOTAL visits	Utilization rate (visits/year)	Weighted average
	<b>OTHER</b>					
A22	USA RES INACT	1	1	0.00%	1.00	
A26	USA APPLICANT	28	55	0.13%	1.96	
A33	USA TDRL	2	10	0.02%	5.00	
K92	EMERGENCY CARE	3	15	0.04%	5.00	
K61	VETERANS ADMIN BENE	1	8	0.02%	8.00	
K99	MASS CAL PATIENT	1	2	0.00%	2.00	
	fy02					
A22	USA RES INACT	1	1	0.00%	1.00	
A26	USA APPLICANT	23	32	0.08%	1.39	
K61	VETERANS ADMIN BENE	3	14	0.03%	4.67	
K92	EMERGENCY CARE	4	11	0.03%	2.75	
K99	MASS CAL PATIENT	2	3	0.01%	1.50	
R73	NATO REC FAM MBR	1	1	0.00%	1.00	
		70	153	0.37%	2.19	2.93
	<b>KATUSA</b>					
K74	KATUSA	107	347	0.83%	3.24	
	fy02					
K74	KATUSA	93	334	0.80%	3.59	
		200	681	1.63%	3.41	3.41
				straight Average	3.14	
	TOTAL COUNT	11999	41786	raw visits/ben	3.48	3.72



## Appendix 4. Descriptive data.

**Age**

		Age, raw	Female	Male
N	Valid	41752	24430	17322
	Missing	0	0	0
Mean		44.27	43.52	45.33
Std. Deviation		14.296	13.608	15.150

**Gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	24430	58.5	58.5	58.5
	Male	17322	41.5	41.5	100.0
	Total	41752	100.0	100.0	

**Beneficiary Category**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Active Duty	9464	22.7	22.7	22.7
	AD Family Member	12981	31.1	31.2	53.9
	Retired	6352	15.2	15.3	69.2
	Retired Family Member	6095	14.6	14.6	83.8
	Civilian	5258	12.6	12.6	96.5
	Other	820	2.0	2.0	98.4
	KATUSA	654	1.6	1.6	100.0
	Total	41624	99.7	100.0	
Missing	System	128	.3		
Total		41752	100.0		

**Appointment type**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ACUTE	7437	17.8	17.8	17.8
	EKG	815	2.0	2.0	19.8
	EST	24752	59.3	59.3	79.0
	GRP	56	.1	.1	79.2
	PROC	93	.2	.2	79.4
	ROUT	9	.0	.0	79.4
	T-CON	6297	15.1	15.1	94.5
	WELL	2293	5.5	5.5	100.0
	Total	41752	100.0	100.0	

## Appendix 5. 121 GH military provider capacity model.

	<b>Data values</b>	121 GH					
Assumptions:	Available clin hrs	7.5					
	Start	weeks/yr	hours/wk	hrs/yr	hrs/mo		
Step 1)		52	37.5	1950	162.50		
	<i>Non-avail time</i>	weeks/yr	days/yr	hrs/yr	hrs/mo		
	Leave	(4.3)	(30.0)	(225.0)	(18.8)		
	Fed holidays	(2.2)	(11.0)	(82.5)	(6.9)		
	CME	(1.1)	(5.3)	(40.0)	(3.3)		
	nonavail sums	(7.6)	(46.3)	(347.5)	(29.0)		
Step 2)	Avail time subTotals	44.45		1602.54	133.55		
Step 3)	Training & Admin time				(70.9)		
Step 4)	<b>Total available clinic time</b>				62.62		
Step 5)		hrs/wk	pts/hr	pts/wk	dys/wk	pts/dy	adj pts/dy
		15.66	3	46.97	5	11.10	9.39
actual hrs/FTE 01 & 02	134.19	33.55	3	100.64	5	20.13	20.13
Step 6)			pts/day				
FTE comparisons		<b>Full time</b>	22.5				
		Mil FTE	0.42				
		act FTE	0.89				
Training & Admin accounting worksheet							
<b>Patient support duties</b>		weeks/yr	hrs/wk	hrs/yr	hrs/mo		
Mandatory training							
Coding				6	0.5		
Tricare on line				2	0.166667		
HIPAA				5	0.416667		
JCAHO				3	0.25		
Customer svc training				2	0.166667		
Department meetings			2	88.89737	7.408114		
T-cons			2	88.89737	7.408114		
Review results			0.833	37.02576	3.08548		
pts/day subtot	11.10						
Dictation/notes	2.84 min/pt		2.62617				
Coding	.43 min/pt		0.997624		1.590497		
Patient preparation	.75 min/pt		0.693531		2.774123		
CHCS	1.89 min/pt		1.747698		6.990791		
E-mail							
PSD Subtotal:					30.75712		
<b>Readiness</b>		weeks/yr	hrs/wk	hrs/yr	hrs/mo		
TDY (38th parallel, etc)				96	8.00		
Deployment (FTX)	1 wks per quarter	4		150	12.50		
ALS courses				5	0.42		
Disaster drills	2 per year			6	0.50		
Department duties							
Command duties							
APFT/weigh-ins	2 per year			4			
PT			3	133.3461			
Urinalysis				1			
Supervisor responsibilities							
OER/NCORs	3 hrs per eval report						
Awards	2 hrs per award						
Civilian reports	3 hrs per eval report						
CPAC training	1 per yr (2dys)			16	1.33		
CTT				5	0.42		
Weapon qualification				12	1.00		
Newcomer orientation				8	0.67		
Provider orientation				8	0.67		
Dental exam/cleaning				1	0.08		
5-yr physical				1	0.08		
Readiness Subtotal:					25.67		
<b>Korea specific</b>		weeks/yr	hrs/wk	hrs/yr	hrs/mo		
in-processing time							
house hunting/move in	5 days per wk	2		75	6.25		
off post rent payment					2.00		
out-processing time		2		75	6.25		
Installation Subtot:					14.50		



## Appendix 7. Average hours per available FTE, FY 2001, 2002.

FP	FY 01						
Month	assigned FTEs	available FTEs	avail hours	hrs/avail FTE	nonavail hrs	hrs - non avail	adj hrs/avail FTE
Oct	0.00	2.94	494.00	168.03	8	486	165.3061224
Nov	0.00	1.94	326.00	168.04	69	257	132.4742268
Dec	0.00	2.30	386.00	167.83	24	362	157.3913043
Jan	0.00	2.03	341.00	167.98	112	229	112.8078818
Feb	0.00	1.77	297.00	167.80	152	145	81.92090395
Mar	4.04	2.68	449.00	167.54	67	382	142.5373134
Apr	5.00	2.57	430.00	167.32	54	376	146.3035019
May	5.04	2.67	448.00	167.79	48	400	149.8127341
Jun	1.00	2.78	466.00	167.63	0	466	167.6258993
Jul	5.00	2.73	458.00	167.77	24	434	158.974359
Aug	1.96	1.17	195.00	166.67	136	59	50.42735043
Sep	5.00	3.22	542.00	168.32	16	526	163.3540373
average:	2.25	2.40	402.67	167.72	59.1666667	343.5	135.7446362
Std dev				0.42			36.59252143
FP	FY 02						
Month	assigned FTEs	available FTEs	avail hours	hrs/avail FTE	nonavail hrs	hrs - non avail	adj hrs/avail FTE
Oct	5.00	5.56	933.00	167.81	4	929	167.0863309
Nov	4.91	3.84	647.00	168.49	24	623	162.2395833
Dec	5.00	3.35	561.00	167.46	154	407	121.4925373
Jan	5.01	3.89	653.00	167.87	186	467	120.0514139
Feb	5.00	3.75	629.00	167.73	81	548	146.1333333
Mar	5.17	4.71	790.00	167.73	144	646	137.1549894
Apr	2.00	3.53	593.00	167.99	98	495	140.2266289
May	3.98	3.35	563.00	168.06	176	387	115.5223881
Jun	3.00	3.08	518.00	168.18	150	368	119.4805195
Jul	3.00	3.09	518.00	167.64	40	478	154.6925566
Aug	3.04	3.35	564.00	168.36	208	356	106.2686567
Sep	4.01	3.00	504.00	168.00	200	304	101.3333333
average:	4.09	3.71	622.75	167.94	122.08	500.67	132.64
Std dev				0.30			21.81
Total ave 2yrs		3.05		167.83	90.63	422.08	134.19
Std dev				0.38	68.25	173.76	29.50

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